REMARKS

The application has been thoroughly reviewed in light of the Office Action dated January 14, 2004. Claims 25, 26, 28-34, and 39-46 are currently pending in this application. Claim 25 has been amended to remove limitations to more accurately reflect the scope of the claimed invention. New claims 47-56 have been added. No new matter has been added. Support for the new claims can be found in the original specification, beginning at page 6 and in Figures 4-8. Reconsideration and allowance of the application, as amended, are respectfully requested.

Claims 25, 26, 28, 30, and 31 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,479,887 to Yoon et al ("Yoon"). The rejection is respectfully traversed.

The present invention relates to semiconductor device packages formed by dicing a semiconductor wafer attached to one side of a dielectric substrate layer which in turn has ball grid arrays attached to the other side. The packages also include a stiff metal layer which permit dicing the wafer and attached dielectric substrate into individual packages. The stiffness ensures a clean cut such that edges of the semiconductor wafer parts align with the edges of the dielectric substrate. None of the cited references, whether considered alone or in combination, anticipate or render obvious the claimed invention.

Yoon does not teach or suggest "a metal layer. . .[having] stiffness sufficient to enable simultaneous dicing of said semiconductor device edges, said dielectric substrate edges, and said metal layer edges, so as to provide said package with aligned edges," as recited by claim 25. The Office Action refers to item 12 of Fig. 13 as disclosing the claimed metal layer, however, item 12 refers to conductive traces which are used for electrical connection of the solder ball pads 13 to the wire leads 14. Col. 9, lines 1-4. These traces form electrical connections but do not constitute the claimed metal layer. The traces do not provide a stiffening function to aid in dicing chips and associated dielectric layer from a wafer having an attached dielectric substrate.

Yoon does not anticipate the claimed invention because Yoon fails to teach or suggest all of the claim limitations recited by claim 25. Claims 26, 28, 30, and 31 depend from claim 25 and contain every limitation recited by claim 25. For at least these reasons, withdrawal of the rejection of claims 25, 26, 28, 30, and 31 is respectfully requested.

Claims 25 and 28-34 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,389,689 to Heo ("Heo"). The rejection is respectfully traversed.

Heo does not teach or suggest all of the claim limitations recited by the rejected claims. Heo does not teach or suggest "a metal layer. . .[having] stiffness sufficient to enable simultaneous dicing of said semiconductor device edges, said dielectric substrate edges, and said metal layer edges, so as to provide said package with aligned edges," as recited by claim 25. Instead, Heo teaches that only "good" semiconductor chips, as determined during testing in a wafer state, are "selectively attached to [the] circuit board sheet." Col. 4, lines 16-20; Col. 5, lines 20-23. Thus, Heo teaches individualized chips being previously diced before attachment to a circuit board. Regardless of what Heo teaches concerning the use of copper, Heo does not teach or suggest a metal layer having "stiffness sufficient to enable simultaneous dicing of said semiconductor device edges."

Further, Applicant maintains that this is an appropriate limitation on the type of metal layer in the package, and not "an intended use" limitation as argued by the Office Action. Office Action, at 5. The claimed metal layer must have a stiffness sufficient to produce the claimed dicing result. Therefore, "stiffness sufficient to enable simultaneous dicing" is a structural attribute of the metal layer, not an intended use.

Claims 28-34 depend from claim 25; accordingly, these claims contain all of the limitations recited by claim 25. Heo does not teach or even suggest each of these claim limitations. For at least these reasons, withdrawal of the rejection of claims 25 and 28-34 is respectfully requested.

Claims 40, 41, 43, and 46 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,143,865 to Hideshima et al. ("Hideshima"). The rejection is respectfully traversed.

Unlike the claimed invention, Hideshima teaches the use of "a solder bump type power bipolar transistor." Col. 4, lines 62-63. Hideshima does not teach or suggest all of the claim limitations recited by the rejected claims. Specifically, independent claim 40 recites "electrical connections between said semiconductor device and said ball grid array." The Office Action refers to items 15B and 15E of Fig. 2 as disclosing the claimed electrical connection. These items, however, refer instead to an aluminum electrode wiring pattern and an emitter electrode wiring pattern. Col. 5, lines 14-15. Most importantly, these electrodes do not connect the ball grid array to the semiconductor device, as shown in Fig. 2. Therefore, Hideshima does not teach or even suggest "electrical connections between said semiconductor device and said ball grid array," as recited by claim 40.

For at least these reasons, Hideshima does not anticipate the claimed invention. Claims 41, 43, and 46 depend from claim 40; accordingly, these claims contain all of the limitations recited by claim 40. Withdrawal of the rejection of claims 40, 41, 43, and 46 is respectfully requested.

Claim 26 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Heo in view of U.S. Patent No. 5,134,539 to Tuckerman et al. ("Tuckerman"). The rejection is respectfully traversed.

The subject matter of claim 26 would not have been obvious over Heo in view of Tuckerman. Specifically, the Office Action does not establish a *prima facie* case of obviousness, which requires "the prior art reference (or references when combined) must teach or suggest all the claim limitations." M.P.E.P. § 2142. As explained above, Heo does not teach or suggest all of the limitations recited by claim 25 (from which claim 26 depends directly). For whatever Tuckerman teaches regarding the use of a metal layer for grounding electrical connections, Tuckerman does not cure the deficiencies of Heo.

Accordingly, neither of the cited references, whether considered alone or in combination, render the claimed invention obvious. For at least these reasons, withdrawal of the rejection of claim 26 is respectfully requested.

Claim 39 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Heo in view of U.S. Patent No. 6,175,084 to Saitoh et al. ("Saitoh"). The rejection is respectfully traversed.

The subject matter of claim 39 would not have been obvious over Heo in view of Saitoh. Specifically, the Office Action does not establish a *prima facie* case of obviousness, which requires "the prior art reference (or references when combined) must teach or suggest all the claim limitations." M.P.E.P. § 2142. As explained above, Heo does not teach or suggest all of the limitations recited by claim 25 (from which claim 39 depends directly). For whatever Saitoh teaches regarding the thickness of a metal layer, Saitoh does not cure the deficiencies of Heo. Accordingly, neither of the cited references, whether considered alone or in combination, render the claimed invention obvious. For at least these reasons, withdrawal of the rejection of claim 39 is respectfully requested.

Claims 42 and 45 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hideshima in view of Saitoh. The rejection is respectfully traversed.

The subject matter of claims 42 and 45 would not have been obvious over Hideshima in view of Saitoh. Specifically, the Office Action does not establish a *prima facie* case of obviousness, which requires "the prior art reference (or references when combined) must teach or suggest all the claim limitations." M.P.E.P. § 2142. As explained above, Hideshima does not teach or suggest all of the limitations recited by claim 40 (from which claims 42 and 45 depend). For whatever Saitoh teaches regarding the thickness of a metal layer, Saitoh does not cure the deficiencies of Hideshima. Accordingly, neither of the cited references, whether considered alone or in combination, render the claimed invention obvious. For at least these reasons, withdrawal of the rejection of claims 42 and 45 is respectfully requested.

Claim 44 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Hideshima in view of U.S. Patent No. 3,918,148 to Magdo et al. ("Magdo"). The rejection is respectfully traversed.

The subject matter of claim 44 would not have been obvious over Hideshima in view of Magdo. Specifically, the Office Action does not establish a *prima facie* case of obviousness, which requires "the prior art reference (or references when combined) must teach or suggest all the claim limitations." M.P.E.P. § 2142. As explained above, Hideshima does not teach or suggest all of the limitations recited by claim 40 (from which claim 44 depends). For whatever Magdo teaches regarding the thickness of a metal layer, Magdo does not cure the deficiencies of Hideshima. Accordingly, neither of the cited references, whether considered alone or in combination, render the claimed invention obvious. For at least these reasons, withdrawal of the rejection of claim 44 is respectfully requested.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

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Respectfully submitted,

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